Cognitive Task Analysis

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Topics

1. Why cognitive task analysis?
2. What is CTA and how is CTA used with GEL?
3. What problems will CTA not solve?
4. What are the arguments against it?
5. What is happening now?

Why Cognitive Task Analysis?

- Doctrine and manuals tell trainees what to do but, trainees also need to know "how to do it"
  - How and when to decide and act
  - Flexible application of knowledge starts with "how"
- Current analysis does not often capture "how" at a level trainees need
  - SME's and most trainers unintentionally leave out 70% of decisions
- We must use special interview strategies
  - With SME's who have current experience
  - Capture how, when, where, why and with what

What is Cognitive Task Analysis?

Six Steps

Interview soldiers with recent experience

1. Outline sequence of tasks “as performed in field” (compare with doctrine)

2. For each task, describe clearly enough so that trainee can apply
   - Field conditions (Where)
   - Cues (What Starts the task)
   - Sequence of Actions and Decisions (How)

What is Cognitive Task Analysis?

3. Collect task-related information about:
   - Supplies and equipment
   - Performance standards (speed, quality)
   - Reasons (Benefits and Risks)

4. Identify conceptual knowledge related to procedure:
   - Concepts (new terms, locations, ideas)
   - Processes (how things work)
   - Principles (what causes things to happen)

What is Cognitive Task Analysis?

5. Collect five field problems trainees will learn to solve
    - One for demonstration during training
    - One for practice and feedback
    - One for progress check
    - Two for competency test
6. Take CTA document from SME A and give to SME B to “correct”
    - Develop a “gold standard” CTA for training

Overview of GEL Design

Select Tasks and SME's –

Conduct CTA Interviews

Information
- Identify 5 problems
- How to act and decide
- New concepts, processes
- Equipment and materials
- Performance standards

Select delivery media

Develop:
- F2F or
- IMI or
- Blended

Design Blueprint
- Sequence Lessons
- Design each lesson with
  - Goals and Reasons
  - Background
  - Demonstration, practice & feedback
- Design Job Aids for transfer

Guided Experiential Learning

The 8 Steps in a GEL Lesson:

1. **Objective** (What trainees will learn to do)
2. **Reasons** (Benefit of learning and Risk of not)
3. **Overview** (Outline of this lesson)
4. **Connection to Prior Knowledge** (Analogy – this is like something you already know)
5. **Conceptual Knowledge** (processes, principles)
6. **When and How** (Step by Step Demonstration)
7. **Practice** (Students solve problems)
8. **Feedback** (what worked, what needs correction)

3. What problems will CTA not solve ?

IF:

- No experts available and/or
- Completely new (novel) equipment or
- New processes and doctrine or
- If “experts” not succeeding at task

THEN: We use traditional analysis techniques

4. CTA Counter arguments

1. Procedural training will not result in flexible, adaptable knowledge and skills
2. CTA will increase development time when we are trying to reduce it.
3. We are already doing it.
4. Developers have not been trained to perform CTA's.

CTA Counter Arguments

1. How do we train for flexible, adaptable knowledge and skills?
   - Must first learn how before flexibly adjusting to a novel situation
   - Flexible adaptation results from “varied practice”
     - Our reason for collecting many problems of increasing difficulty and novelty for practice and tests
   - Novel application requires conceptual knowledge that is connected to skills
     - We teach all necessary conceptual knowledge but connect it to each procedure

CTA Counter Arguments

2. CTA will increase development time when we are trying to reduce it

- CTA increases design time by about 20%
- But it decreases training time by 20 – 50%
  - By lowering cognitive load on trainee through combining theory and practice
- If IMI is being developed, CTA permits rapid development

CTA Counter Arguments

3. We are already doing it.

Please contact me with examples:

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CTA Counter Arguments

4. Developers have not been trained to perform CTA's

   Plans are underway to gradually train CP32's and others to conduct CTA's

   Cannot be learned in a brief workshop – requires practice and feedback over time

What is happening now with CTA?

nALM Pilot test

Now capturing about 10 – 20% of three courses in GEL and comparing them to SAT versions

- BSNCO Course at Ft. Bliss
  - Plans, orders & annexes – Graphics and Overlays
- Signals CCC at Ft Gordon
  - MDMP (Military Decision Making Process)
- Field Artillery CCC at Ft Sill
  - Fire Support

Questions? Comments?